Office of National Marine Sanctuaries
National Oceanic and Atmospheric Administration
STELLWAGEN BANK NATIONAL MARINE SANCTUARY

# A Child's Sanctuary

## Activity Guide
## February 2014

Anne Marie Runfola/SBNMS

## Exploring the Maritime Heritage of Stellwagen Bank National Marine Sanctuary

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## Exploring the Maritime Heritage of Stellwagen Bank National Marine Sanctuary

We created this program, including the activity guide and kits, to bring to life the rich maritime heritage of Stellwagen Bank National Marine Sanctuary and to highlight NOAA's role in heritage resource conservation and preservation. Our goal is to spread the word that these resources belong to everyone and that we all have a role to play in preserving them for future generations.


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|---|---|
| Matthew Lawrence | Maritime Archaeologist, SBNMS |
| Deborah Marx | Maritime Archaeologist, SBNMS |
| Anne-Marie Runfola | Volunteer Program Coordinator, SBNMS |



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Cape Cod Museum of Natural History, Gates Intermediate School Environmental Club, Maritime Gloucester, NOAA Northeast Fisheries Science Center, NOAA Fisheries Northeast Regional Office, NOAA Office of National Marine Sanctuaries, NOAA Preserve America Initiative, NOAA Stellwagen Bank National Marine Sanctuary staff and volunteers, Seacoast Science Center, South Shore Natural Science Center.

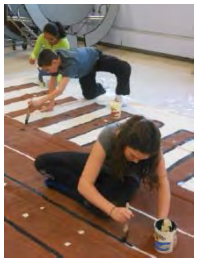


For more information, please contact Anne-Marie Runfola, anne-marie.runfola@noaa.gov







# Diving for Facts

(NOAA/SBNMS)

## Grade Level

- Pre-K through 6th Grade

## Timeframe

- 5 – 15 minutes

## Materials

- Inflatable or rigid children's pool, blue tarp, or other prop that represents water
- Magnetic diving poles
- Laminated cards

## Themes

Stellwagen Bank Sanctuary
- Maritime Heritage
- Technology
- Fauna

(NOAA/SBNMS)

(NOAA/SBNMS)

## Activity Summary

Stellwagen Bank National Marine Sanctuary sits astride the historic shipping routes and fishing grounds for numerous ports around Massachusetts. These ports have been centers of maritime activity in New England for hundreds of years. Historic uses of the sanctuary are evidenced by the remains of historic shipwrecks on the seafloor. *Diving for Facts* employs a fun medium to introduce participants to the people, places and things associated with the sanctuary's maritime heritage.

## Learning Objectives

Participants will be able to identify and define or describe
- Several significant shipwrecks located in the sanctuary.
- Two historic figures illustrating the sanctuary's maritime heritage.
- Animals that use the shipwrecks as habitat or that are found in surrounding sanctuary waters.
- Technology used to discover, identify, document and protect the sanctuary's maritime heritage resources.

Add props for visual impact, but make sure they reference local habitat. For example, the rocks above depict boulder substrate found in the sanctuary. Coral or seaweed would not be appropriate substitutes. (NOAA/SBNMS)

## Background Information

America's greatest museum of our past as a seafaring nation lies on the bottom of the sea and lakes in the National Marine Sanctuaries. Prehistoric sites, shipwrecks, and naval battlefields are protected by sanctuaries. They are places to explore, discover and appreciate our country's maritime cultural heritage. That heritage is a legacy of thousands of years of settlement, exploration, immigration, harvesting the bounty of the seas, and creating coastal communities and maritime traditions. Through the study, protection and promotion of this diverse legacy, sanctuaries help Americans learn more about our past.

The sanctuary is home to numerous shipwrecks, reminders of this nation's maritime heritage. These shipwrecks are tangible connections to the past that allow us to study and better understand human history. The sanctuary is required by the National Marine Sanctuaries Act and the National Historic Preservation Act to locate, assess, protect, manage, and interpret its maritime heritage resources. Shipwrecks are nonrenewable gateways to the past and it is through the interpretation of these archaeological resources that the sanctuary hopes to increase public enjoyment and appreciation of New England's maritime history and foster stewardship of America's maritime legacy.

**Vocabulary –**

NOTE: Definitions and descriptions of images are located on the reverse side of each card.

## Procedure

- Set up children's pool or other container or area delineated as sanctuary waters. (Do not add water.)
- Scatter the 19 laminated cards in pool. Place diving poles around pool.
- This activity can be offered without staffing, as it is self-explanatory. If an activity leader is available, it can be more interactive:
- Instruct participants to send their divers down into sanctuary waters to explore and retrieve cards depicting sanctuary shipwrecks, animals, and other maritime heritage-related items.
- Ask participants to look at each image and try to identify it. Have them read the back of each card. Activity leaders, parents, and older children can help by reading descriptions to, or with, younger participants. This helps engage and educate a larger audience.
- Encourage participants to ask questions about what they find and to share what they know about the items. Share additional information as needed to make the activity interactive.

## Notes on Materials

Diving Poles: 12" dowels; string threaded through eyelets or drilled holes; magnet tied to toy diver.

Cards: Laminated images with descriptions on back of each. Metal washers are glued to the cards, allowing participants to "grab" cards with the magnetic diving poles.

Sanctuary Waters: If you do not have a children's pool, you can use blue tarp, crepe paper or rope to delineate the sanctuary directly on the floor or low table.

## Key Messages

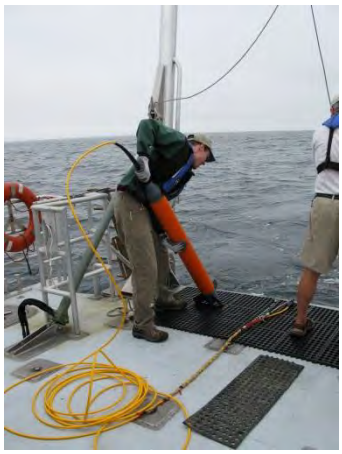
- Stellwagen Bank National Marine Sanctuary sits astride the historic shipping routes and fishing grounds for numerous ports around Massachusetts.
- The sanctuary seafloor is a museum of New England's seafaring past. Historical records indicate that more than 100 historic shipwrecks may exist in the sanctuary providing evidence of our seafaring past.
- The sanctuary's mission includes protecting its maritime heritage resources.
- Sanctuary maritime archaeologists have located 50 shipwrecks and identified a dozen of them by name. Some of these vessels are historically significant. The sanctuary has successfully petitioned for six shipwrecks to be placed on the National Register of Historic Places.
- Sanctuary archaeologists use technology to help in the discovery through protection of these resources.

## For More Information

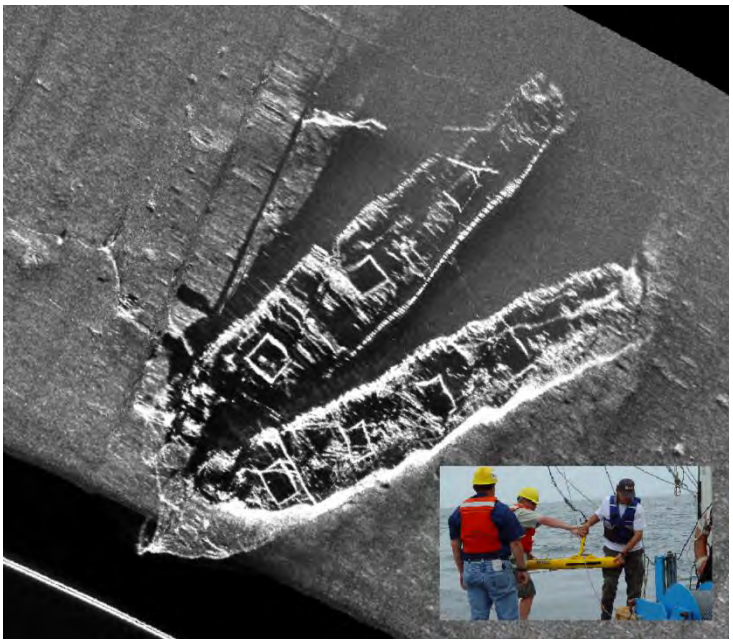
NOAA's Stellwagen Bank National Marine Sanctuary is the resting place for hundreds of shipwrecks.
http://stellwagen.noaa.gov/maritime/welcome.html

NOAA's Maritime Heritage Program is an initiative of the Office of National Marine Sanctuaries that focuses on maritime heritage resources within the National Marine Sanctuaries and Marine National Monument. http://sanctuaries.noaa.gov/maritime/

Dr. James Delgado, Director of Maritime Heritage for the Office of National Marine Sanctuaries, and renowned explorer describes the importance of maritime heritage. http://goo.gl/oxnCmX



Above and Below: Sampling of laminated cards included in the activity.



# Shipwreck Investigation Activity

Divers prepare to descend to a Sanctuary shipwreck (NOAA/SBNMS).

## Grade Level

- All ages

## Timeframe

- 5-15 Minutes

## Materials

- 1 Mock Shipwreck Map
- Laminated Artifacts
- Clipboards and Pencils
- Activity Sheets (2 options based on age)
- SCUBA diving masks

## Themes

- Maritime Archaeology
- Shipwrecks & Maritime History

Archaeologists document artifacts, like these teacups on the shipwreck of the steamship *Portland*, to learn more about shipboard life in the 19th century (NURTEC-UConn and NOAA/SBNMS).

## Activity Summary

Maritime archaeologists study the physical remains of sunken ships to learn about our past and connections to the sea. Maritime archaeological sites usually result from shipwrecks and thus represent a moment in time rather than a slow deposition of material accumulated over a period of years. This fact has led to shipwrecks being described as time capsules. Underwater archaeological sites often have better preservation of organic artifacts, as compared to archaeological sites on land, allowing researchers to learn about past human cultures in more detail. This activity connects the concept of using physical artifacts present on a mock shipwreck to answer research questions to uncover the vessel's history. Participants can "dive in" without getting wet and will be introduced to the field of maritime archaeology and learn how archeologists function as detectives to put together all the clues from a shipwreck site to tell the story of its loss.

## Learning Objectives

Participants will be able to:

- Learn about the field of maritime archaeology.
- Use the techniques and tools maritime archaeologists employ to document a shipwreck.
- Gather data through physical observation.

The mock shipwreck provides a way for families to work together as "buddy teams" just as archaeological divers do to map a shipwreck. (NOAA/SBNMS).

## Background Information

This activity is based on the techniques that maritime archaeologists use underwater to document a shipwreck. To learn about the past, archaeologists must collect data and answer research questions to learn about the vessel's construction and life onboard from the artifacts left behind. Much like detectives, archaeologists search for evidence and analyze clues to reach a conclusion. Students will use their deductive reasoning skills to answer questions about the wreck specific to their observations. The mock shipwreck represents only a small a section of the vessel's wooden hull that has been uncovered from the sediment during an excavation. The rest of the vessel is still buried. The shipwreck is located over 30 miles east of Boston, MA in the Stellwagen Bank National Marine Sanctuary.

Stellwagen Bank archaeologists spend many days every year mapping the seafloor to discover lost ships. Once discovered they document the shipwreck sites as part of the sanctuary's maritime heritage characterization and monitoring program. These activities fulfill NOAA's National Historic Preservation Act mandates, which require federal agencies to inventory the historic properties under its jurisdiction, assess them for eligibility to the National Register of Historic Places, and nominate eligible sites to the National Register of Historic Places.

## Vocabulary

MARITIME ARCHAEOLOGY - A discipline that studies human interaction with the sea, lakes and rivers through the study of vessels, shore side facilities, cargoes, human remains and submerged landscapes.

MARITIME HERITAGE - the broad legacy of human endeavors that not only includes archaeological resources, such as historic shipwrecks and prehistoric archaeological sites, but also archival documents, oral histories, and traditional seafaring and ecological knowledge of indigenous cultures.

ARTIFACT - any object made or modified by a human culture, and often one later recovered by an archaeological endeavor.

SHIPWRECK - Remains of a wrecked ship or the event that caused the wreck, such as the striking of something that causes the ship to sink, the stranding of the ship on rocks, land or shoal, or the destruction of the ship at sea by violent weather.

SCUBA (Self Contained Underwater Breathing Apparatus) – A portable apparatus containing compressed air and used for breathing under water.

## Procedure

1) Layout mock shipwreck canvas on the floor.

2) Place artifacts throughout shipwreck.

3) Have the students work in "buddy teams" to SCUBA dive down to the shipwreck and answer the research questions or complete the scavenger hunt.

4) If needed, work with students to help them answer the questions.

5) Have the students explain their answers.

## Additional Activities

THE "ME" CONNECTION

Based on their observations of the wreck, students can write a short essay and prepare a brief oral presentation from the perspective of a member of the ship's crew. They must determine a time period based on their hypothesis for their period of dress, what their life might have been like to be the captain, deck hand, cook or first mate. Have them describe their lives during that time period, and have them share some stories of adventure as if they were sailing on this vessel during a certain time period.

## Key Messages

- Maritime archaeologists are like underwater detectives who are trying to solve unanswered questions based on physical clues or "artifacts."
- To learn about the past, archaeologists must collect data and answer research questions to learn about the vessel's construction and life onboard from the artifacts left behind.
- Tools archaeologists use while diving on a shipwreck include tape measures, pencils, clipboards or slates, and special plastic paper that allows you to write underwater.

## For More Information

NOAA's Stellwagen Bank National Marine Sanctuary is the resting place for hundreds of shipwrecks.
http://stellwagen.noaa.gov/maritime/welcome.html

NOAA's Maritime Heritage Program is an initiative of the Office of National Marine Sanctuaries that focuses on maritime heritage resources within the National Marine Sanctuaries and Marine National Monument. http://sanctuaries.noaa.gov/maritime/

ONMS developed additional mock shipwreck lesson plans and supplementary PDF's.
http://sanctuaries.noaa.gov/education/teachers/features/mh.html

A NOAA archaeologist documents a shipwreck in the Thunder Bay National Marine Sanctuary in Michigan (NOAA/ONMS).


It is never too early to start learning about the wonders of the undersea world. (NOAA/SBNMS).

Mock Shipwreck's Possible Identity

2-masted schooner *Georgie D. Loud*
Length: 100 ft
Built in 1872 in Waldoboro, Maine (see launching article)
Homeport: Machias, Maine

After departing Jonesport, Maine, the *Georgie D. Loud* sprang a leak off Thatchers Island. The five-man crew was rescued by a passing steamer approximately 50 miles east of Boston on 9/15/1904 and taken into Boston (see wreck article).

Schooner similar to what the *Georgie D. Loud* might have looked like

LAUNCHED—At Waldoboro, Me, from the yard of Edwin Achorn & Co, on the 15th inst, a splendid schooner of 198 tons, old measurement, called the Georgie D Loud. Length keel 96 feet, on deck 101 feet, width 28 feet 1 inch, depth 8 feet. Owned by Kilham, Loud & Co, J Baker & Co, Boston, Josiah Whitehouse, of St George, Me, and Capt Aaron Wall, of St George, Me, who is to command her. She hails from Boston.

**Launching article**
**New York *Herald* 10-24-1872**

BURNS VESSEL.—Capt Smith Sets Fire to Derelict. Crew

# BURNS VESSEL.

## Capt Smith Sets Fire to Derelict.

## Crew of the Georgie D. Loud Rescued by Steamer Olivette.

## The Great Storm Piled Up Many Craft.

Five men, the captain and crew of the two-masted schooner George D. Loud of Jonesport, Me, were landed here yesterday morning by the Plant line steamer Olivette, Capt Turner, which rescued them from their dismantled and waterlogged craft when hope of being saved had been abandoned by all hands. The men are Capt E. C. Smith of Jonesboro, mate John Wallace of Jonesboro, cook Edward Foley of Jonesport, seamen Frank Foss of Jonesport and George Clark of Calais.

The captain said that at midnight Wednesday the Loud was in the vicinity of Thatchers island. For safety the schooner was headed off shore, but the pounding she received soon caused her to spring a leak. The men worked constantly at the pumps, but the water gained so rapidly that she was soon full.

All Wednesday night and Thursday the men worked without ceasing. At 1 p m Thursday, fearing the vessel would capsize, Capt Smith ordered the masts cut away. By this time the cabin, forecastle and galley had been completely washed out, and the men were forced to seek refuge on the after house. Their boat had been washed away, and they were without any means of escaping from what seemed certain doom.

At 7:45 Thursday night, Boston light bearing west and 40 miles distant, the Olivette hove in sight, and running down close to the wreck stood by and took off all hands. The men saved absolutely nothing but the clothes they had on.

After the shipwrecked crew had been taken on board the chief officer of the Olivette returned to the Loud and set fire to her, in order to rid the ocean of a dangerous derelict.

The Georgie D. Loud was built at Waldoboro, Me, in 1872, and was owned by D. J. & E. M. Sawyer of Jonesport. She was valued at $3500, and was uninsured. She was 101 feet long, 28 feet beam, 8 feet depth of hold, with a net tonnage of 147 and a gross tonnage of 175. The cargo was insured.

The Olivette herself met terrible weather on the passage from Halifax, and was 36 hours in reaching here. The gale made it necessary to heave her to for six hours at one time.

At 4 30 p m Thursday in lat 42° 28' N, lon 68° 31' W, the steamer passed the schooner Jonathan Sawyer of Dover, Capt Reynolds, bound from Stonington, Me, for New York. It was too rough at the time to render assistance, but she appeared to be making good weather of it, and those on board made no request to be taken off.

At 7:15 that evening, seven miles to the westward of the Sawyer, the schooner John Proctor of Boston, Capt Donovan, from Hillsboro, N S, for New York with plaster, was passed. Her captain requested to be reported all well. A fishing schooner was standing by the Proctor at the time.

**Wreck article**
**Boston Daily *Globe* 9-17-1904**

# Shipwreck Scavenger Hunt

What can this shipwreck tell you about the past?

## Find the shipwreck artifacts

☐ **Bottles**

☐ **Plates**

☐ **Rope**

☐ **Bones**

☐ **Jewelry**

☐ **Coins**


☐ **Nails**

☐ **Utensils**

# Shipwreck Investigation

What can this shipwreck tell you about the past?

You are a maritime archaeologist at the Stellwagen Bank National Marine Sanctuary and you have found this shipwreck 20 miles off the coast of Massachusetts.

Look at the artifacts and answer the questions below to uncover its history.

1) What did the people drink? _____

2) What did the people eat? _____

3) Where was the ship coming from? _____

4) What year did it sink? _____

5) Were there women onboard? _____

6) Were there children onboard? _____

Notes and Sketches:

# Side Scan Sonar Matching Activity

Side Scan Sonar Towfish Being Deployed off a Research Vessel (NOAA/SBNMS)

## Grade Level

- All ages

## Timeframe

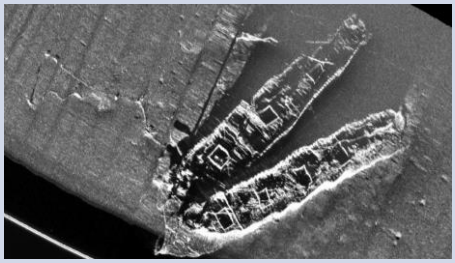
- 5-15 Minutes

## Materials

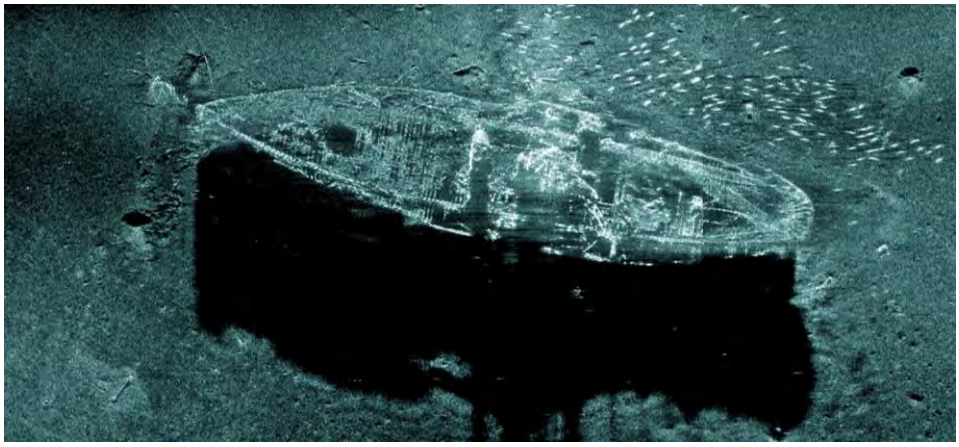
- 7 Laminated Side Scan Sonar Images
- 7 Laminated Shipwrecks
- 1 Laminated Sample Matched Sonar Image and Shipwreck

## Themes

- Remote Sensing Technology
- Maritime Archaeology
- Shipwrecks & Maritime History



Side Scan Sonar Image of the Collided Schooners *Frank A. Palmer* and *Louise B. Crary* (NOAA/SBNMS)



Side Scan Sonar Image of the Steamship *Portland* (NOAA/SBNMS and AST)

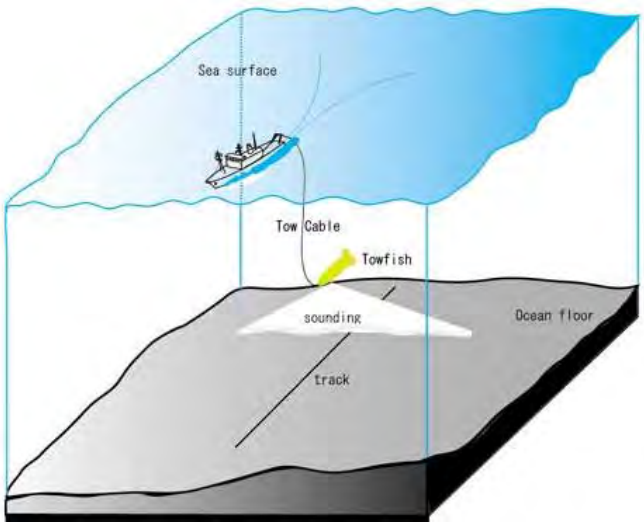
## Activity Summary

Sound can be used as a tool for looking at your surroundings in a new way. In the natural world, bats use sound to "see" in the dark. Underwater, dolphins and whales use sound to explore their environment. This activity connects the concept of using sound to create images with the technology of side scan sonar mapping. Side scan sonar is used extensively by maritime archaeologists to map the bottom of the oceans and is a remote method of sensing the world around us. Participants will be introduced to the way side scan sonar transmits and receives sound pulses to "image" what is on the ocean bottom. Computers translate the sound waves into digital representations of the seafloor and any shipwrecks within range of the sonar pulses. Archaeologists then use these images to characterize the shipwreck. In this activity, participants will compare actual side scan sonar images from the Stellwagen Bank sanctuary with information and photos of vessels to match the correct side scan sonar image to the vessel. By using clues from the side scan sonar students will identity the vessel and explain why they came to their decisions.

## Learning Objectives

Participants will be able to:

- Explain what is side scan sonar.
- Describe how archaeologists use side scan sonar to find shipwrecks.
- Match the side scan sonar image to the correct vessel/shipwreck.




Research Vessel Towing the Side Scan Sonar Towfish
(www.ohti.co.jp/technology.htm)

## Background Information

Maritime archaeologists use side scan sonar to map the seafloor and locate lost ships. This remote sensing technology allows scientists to explore in deep waters and survey large areas at a time. Side scan sonar is a device that creates a digital image of the seafloor by transmitting acoustic pulses and then measuring how quickly the echo is detected and the strength, or how "loud" of the return echo. A towfish is towed behind a research vessel that is outfitted with transducers on either side that send out and receive the acoustic pulses. The data travels back to a computer that processes the towfish signal and allows scientists to "see" the seafloor and pick out anomalies. Anomalies are unusual features on the seafloor that do not look like the surrounding environment. They can be shipwrecks, pipelines, anchors, or other manmade objects. Anomalies are then investigated by divers or underwater robots to visually document the source of the anomaly on the seafloor. Sometimes shipwrecks look like rock in side scan sonar data and vice-versa.

Stellwagen Bank archaeologists spend many days every year mapping the seafloor to discover lost ships. This method is how most of the shipwrecks have been located in the sanctuary including the steamship *Portland*.

## Vocabulary

SIDE SCAN SONAR – Instrument that uses sound to "image" the seafloor to locate shipwrecks or other features on the seafloor.

TOWFISH – Torpedo shaped fish towed behind a research vessel that sends out sound pulses. A computer receives the data from the towfish and produces digital "images" of the seafloor.

TRANSDUCER – Device that sends out the acoustic signal. There are two of them mounted on either side of the towfish.

NADIR – Area directly under the towfish that does not contain seafloor data. The gap is caused by a separation between the transducers' beams.

ANOMALY – Unusual feature detected by the side scan sonar that does not look like the surrounding environment, it may be a manmade structure such as a shipwreck.

## Procedure

1) Lay out the 7 side scan sonar images next to the 7 shipwreck pages (making sure that they correctly matched pairs are not next to each other).

2) Explain what is side scan sonar and how archaeologists use it to locate shipwrecks.

3) Show an example of a "matched" side scan sonar image with a shipwreck.

4) Have the students try and match the correct side scan sonar image to the shipwreck.

5) Work with student to identify the shipwreck and explain similar features between the sonar image and shipwreck photos.

## Key Messages:

- Maritime archaeologists use side scan sonar to map the Stellwagen Bank National Marine Sanctuary's seafloor to locate shipwrecks.
- Side scan sonar uses sound to produce digital "images" of the ocean's floor similar to how bats and dolphins use sound to navigate their environment.
- Side scan sonar is one of the most common tools used by archaeologists around the world to find lost vessels. Once a target is located with sonar it is examined with SCUBA divers or remotely operated vehicles (underwater robots equipped with lights and cameras) to determine if it is a shipwreck or not.
- Many Stellwagen Bank Sanctuary shipwrecks were initially located with side scan sonar such as the steamship *Portland* and schooners *Frank A. Palmer* and *Louise B. Crary*.

## For More Information:

NOAA's Stellwagen Bank National Marine Sanctuary is the resting place for hundreds of shipwrecks: http://stellwagen.noaa.gov/maritime/welcome.html

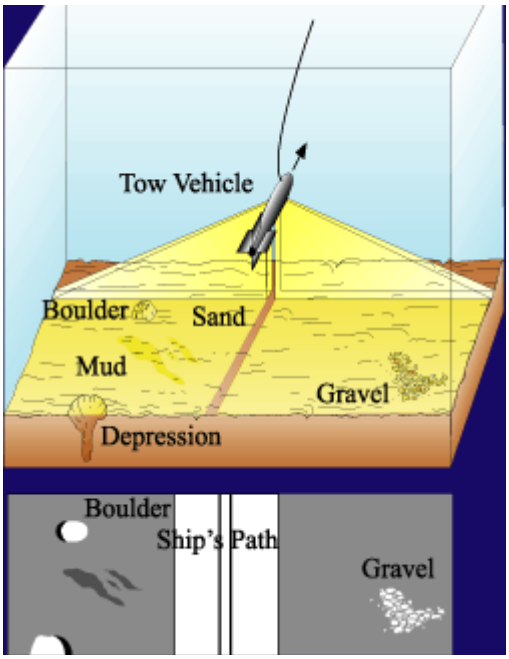
NOAA's National Ocean Service has a webpage describing how side scan sonar works: http://oceanservice.noaa.gov/education/seafloor-mapping/how_sidescansonar.html

NOAA's Office of Coast Survey uses side scan sonar to map the seafloor and produce nautical charts. http://www.nauticalcharts.noaa.gov/hsd/SSS.html

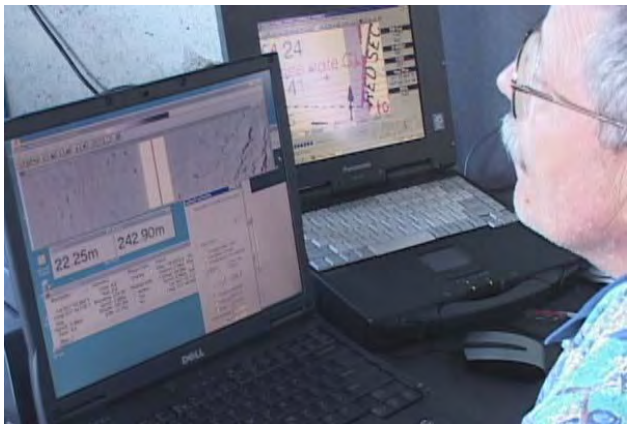
NOAA's Office of Ocean Exploration developed a lesson plan called "Ping" to teach about sonar: http://oceanexplorer.noaa.gov/explorations/03portland/background/edu/media/portlandping.pdf

NOAA' Office of Ocean Exploration Ocean Explorer webpage describes sonar and its uses at: http://oceanexplorer.noaa.gov/technology/tools/sonar/sonar.html

Side scan sonar towfish deployed off Hawaii (NOAA).




Side scan sonar diagram depicting the sonar pulses projecting from its transducers as well as the nadir under the towfish.



Computer software is used to display and collect the side scan sonar mapping data (J. Smith and C. Kelley).

# Investigating the Seafloor

## Diverse Tools Assist Sanctuary Researchers

A variety of tools and techniques are used to map and monitor the seafloor, and to locate and document shipwrecks and other research sites. Since the Stellwagen Bank National Marine Sanctuary seafloor lies at depths ranging from 65 to 600 feet, sophisticated equipment is often needed.

**Side-scan sonar** uses sound to image the seafloor. A device towed behind a research vessel (called a "towfish" because of its shape) registers reflected sound, and a computer on board interprets the sound into a seafloor image. Side-scan sonar shows variations in underwater bathymetry, and the parts of shipwrecks that protrude above the seafloor.

Photos: (Top) Scuba divers study shipwrecks, assist in the placement of research and monitoring equipment, and document sanctuary resources with photography and videography; (Middle) A remotely operated vehicle is deployed from a research vessel; (Bottom) A researcher prepares a side scan sonar "towfish" (yellow) and a magnetometer (orange) for use in the sanctuary.

Credit (all photos this page): SBNMS

**Magnetometers** are towed from a research vessel and used to detect variations in the Earth's magnetic field that may be caused by iron or other magnetic materials. A magnetometer can detect shipwreck features such as anchors, cannons and machinery even if they are embedded in the seafloor.

**Scuba divers** can examine and document shipwrecks in the relatively shallow water atop Stellwagen Bank. Scuba equipment allows the researchers to comfortably breathe and stay warm in the cold New England water. Archaeological divers carry measuring tapes, slates, and pencils to create scaled drawings of the shipwrecks. The scaled drawings are analyzed and compared to historical records that might reveal when the ship was in service and what kind of vessel it was. Divers also use video and still photography to document the site and its artifacts.

**Remotely Operated Vehicles (ROVs)** equipped with lights and cameras are used to explore shipwrecks in deeper sections of the sanctuary. ROVs are tethered robots that "fly" through the water, allowing sanctuary scientists to spend hours gathering archaeological data without being limited by the cold water, air supply and depths. ROVs are launched and controlled from a research vessel positioned above the shipwreck. Archaeologists study the video transmitted through the tether to determine the age, characteristics and possible identity of the shipwreck. The sanctuary conducts yearly ROV cruises in partnership with the National Undersea Research and Technology Center at the University of Connecticut (NURTEC-UConn) and other institutions.

**Autonomous Underwater Vehicles (AUVs)** are the newest type of technology used by the sanctuary. AUVs are un-tethered robots programmed to maneuver along a predetermined path and fulfill a specific function, such as taking photographs or sampling the water. After the AUV completes its mission, it returns to the surface where researchers retrieve it and download the data collected during the mission. AUVs used by the sanctuary to investigate maritime heritage resources have been outfitted with downward-facing cameras to gather images that can be pieced together to build a photo-mosaic. The sanctuary has conducted AUV surveys on shipwrecks in partnership with the Woods Hole Oceanographic Institution, the Naval Undersea Warfare Center, and NURTEC-UConn and other institutions.

# Sailors Valentines

The activity captured this fourth grader's full attention for hours. (NOAA/SBNMS)

## Grade Level

- All ages

## Timeframe

- 30-60 minutes

## Materials

- Seashells
- Small rimmed paper plates
- Clear, quick-drying glue
- Sample images
- Completed sample (optional)

## Themes

- 19th Century Maritime History
- Indigenous Art
- Maritime Art Collections

Modern valentine based on traditional design.
http://www.janeausten.co.uk/how-to-make-sailors-valentine/


Hinged, Double Sailors' Valentine—"Forget Me Not", ca. 1870. Courtesy of Strong Museum. http://www.tfaoi.com/aa/6aa/6aa266.htm

## Activity Summary

In the 1800s, sailors spent many months or years at sea with few or no ways to communicate with their loved ones. When the men returned home, they brought gifts of handmade shell mosaics to let their wives and girlfriends know they were missed. The intricate designs of these "sailors' valentines" included sentimental messages and repeating patterns. Some believe the sailors made the mosaics themselves during their voyages, but many surviving examples were made by native craftspeople in the West Indies, along a popular nineteenth century trade route. Either way, the valentines surely provided recipients great joy and are now artifacts telling of the marine life and native lifestyle found on maritime voyages in that time period.

Sailors' valentines are experiencing a resurgence of interest, and this activity allows participants to create their own version. Constructing the detailed geometric patterns offers time to reflect on the seafaring lifestyle of the 1800s, the ingenuity of native artisans, and the human desire to collect mementos from other cultures.

## Learning Objectives

Participants will be able to:

- Describe who made sailors' valentines and how, when, and where they were created.
- Make their own sailors' valentines.

Left: Unusual anchor shape with heart-shaped pin cushion at cross bar. Courtesy of Mystic Seaport.
(http://mobius.mysticseaport.org/grabimg.php?wm=1&kv=150079)

Right: Hand-tinted ambrotype photograph centers this piece. Courtesy of Houston Museum of Natural Science.
(https://blog.hmns.org/2009/02/100-years-100-objects-sailors-valentine/)

## Vocabulary

SAILORS' VALENTINE – seashells glued onto a backing in intricate patterns, some with sentimental messages incorporated into the design. Many were made by artisans in Barbados in the 19th century and purchased by sailors as gifts for their loved ones back home.

SHELL COLLECTION – loose groupings of seashells and other marine artifacts from around the world. Collected by ship captains and crew as souvenirs of their voyages and for scientific study. Often displayed in upright cabinets or boxes.

MOSAIC – an artistic technique created by pressing many small pieces of hard materials such as tile, glass or shells to a backing using an adhesive materials such as glue or cement.

## Background Information

Nineteenth century sailors could not send letters home to their loved ones easily. Instead, they brought home gifts of intricately designed shell mosaics, many made by artists in Barbados, a regular stop on the maritime trade routes. In the later 1800s, the mosaics sometimes included sentimental messages spelled in shells, such as "Forget Me Not," "Home Sweet Home," and the more commercial "A Present from Barbados."

Sailors' valentines differ from shell collections gathered for scientific study or to showcase a person's world travels. Shell collections were often displayed loose and unglued in cabinets or rectangular boxes. They contained shells from all over the world, rather than just from the West Indies and included other natural history curios such as interesting rocks and sharks' teeth.

Traditional valentine designs include all white themes, stars, hearts, and pink rosette centers and use hundreds of shells. Valentines from this era can be seen at Mystic Seaport and the Nantucket Whaling Museum. Even if sailors didn't make the valentines themselves, they give us insight into native crafts produced along the trade route and tell the very human stories of seafaring men missing their families.

## Procedure

- Cover work area with a protective cloth.
- Lay out all materials. Place one paper plate and approximately ⅛ cup small-sized and ¼ – ½ cup medium-sized seashells at each participant's station.
- Explain what a sailors' valentine is and show examples. Give background information and point out typical themes used in the 1800s.
- Instruct participants to draw concentric circles or other outlines on their plates if it will help them lay out their designs (generally for older students/more complex designs).
- Instruct students to place shells on plate in design pattern, and then glue them into place.
- Set aside valentines until dry. Have participants sign and date their pieces along the rim or on back.
- Ask students to share their work with the group.

## Notes on Materials

We used white Chinet 6 ¾ inch dessert plates because they absorb the glue, are stiff enough to hold the weight of the shells, and have a rim for a more authentic 3-D effect. Wooden and cardboard backings can also be used. Painting or coloring the backing material is an interesting variation.

We used Aleene's Clear Gel Tacky Glue because it dries quickly and clearly. It is relatively thick so it doesn't smear much while participants are repositioning shells or run if they tilt their pieces before dry.

## Key Messages

Sailors' valentines

- were originally 19th century shell mosaics, often made by artisans in Barbados and purchased by sailors as souvenirs.

- illuminate the maritime and natural history of the time period through the craft techniques, varieties of animal shells, and the dual human stories of seafaring adventure and longing for home.

## For More Information

Mystic Seaport Library References:
http://library.mysticseaport.org/searchre.cfm?cx=001008294681395800055%3Abhbk6o71z4q&cof=FORID%3A11&ie=UTF-8&q=sailors+valentines&sa=Online+Collections

Sailors' Valentines - Johnson, Jennifer Sheperd
*Log of Mystic Seaport*, Vol. 43, no. 4.(Winter, 1992): 106-107:
http://library.mysticseaport.org/initiative/ImText.cfm?BibID=43045&ChapterId=1

Mystic Seaport Artifacts:
http://mobius.mysticseaport.org/detail.php?t=subjects&type=related&kv=4183

NOAA/Stellwagen Bank National Marine Sanctuary's Maritime Heritage:
http://stellwagen.noaa.gov/maritime/welcome.html






Above—Examples created in 20-30 minutes (in pairs, from top to bottom): 5-year old, 9-year old, and adults.

Below—This activity is appealing across generations. (NOAA/SBNMS)


# Puzzles and Games Guide

## Grade Level

- All ages

## Timeframe

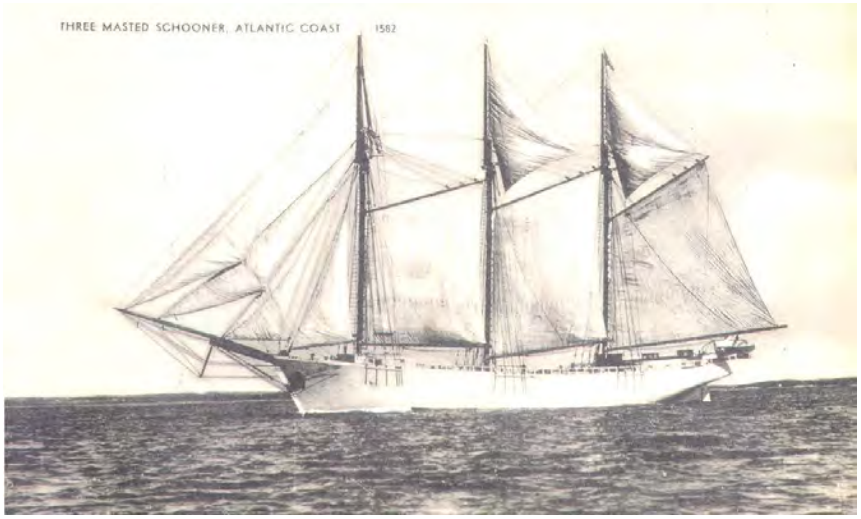
- 5-15 Minutes

## Materials

- Printed Game Sheets (coloring pages, crossword, word search, mazes and origami)

## Themes

- Maritime Archaeology
- Shipwrecks & Maritime History




bulk items like coal, lumber, and ice *(NOAA/SBNMS)*

## Activity Summary

Puzzles and games are a nontraditional way to introduce students to new vocabulary or concepts. These interactive learning techniques will help students learn information in a fun way either singular or in a group. The *Child's Sanctuary* program developed a crossword, word search, and two mazes based on Stellwagen Bank Sanctuary shipwrecks and maritime history/archaeology. Coloring pages and origami sheets are also included.

## Learning Objectives

Students will be able to:

- Word Search: Understand the vocabulary associated with the Stellwagen Bank Sanctuary as well as the field of maritime archaeology and history.
- Crossword: Learn about several Sanctuary shipwrecks and events surrounding their sinking.
- Maze - difficult: Understand how archaeologists use tools such as ROVs to document shipwrecks.
- Maze – easy: Explain how being a SCUBA diver can help if you are an archaeologist.
- Coloring Pages and Origami: Provide artistic opportunities while learning about maritime heritage.

## Background Information

The Stellwagen Bank Sanctuary is home to numerous shipwrecks, reminders of this nation's maritime heritage. These shipwrecks are tangible connections to the past that allow us to study and better understand human history. The sanctuary is required by the National Marine Sanctuaries Act and the National Historic Preservation Act to locate, assess, protect, manage, and interpret its maritime heritage resources. Shipwrecks are nonrenewable gateways to the past and it is through the interpretation of these archaeological resources that the sanctuary hopes to increase public enjoyment and appreciation of New England's maritime history and foster stewardship of America's maritime legacy.

The sanctuary conducts several projects a year to locate, document, and monitor maritime heritage resources. Past projects range from scuba diving investigations to remotely operated vehicle (ROV) expeditions. The sanctuary's archaeological research seeks to explore the sanctuary's heritage resources residing on its seafloor and interpret the physical reminders of past events to allow the public a greater understanding of its heritage.


## Key Messages

- Stellwagen Bank National Marine Sanctuary is New England's only National Marine Sanctuary and is home to hundreds of historic shipwrecks.
- Shipwrecks are a way to learn about our past and serve as underwater museums.
- Historic shipwrecks located in the Stellwagen Bank NMS are protected by laws which prevent disturbance, salvage, and removal of artifacts.
- The most well-known shipwreck is the steamship *Portland* which sank with all hands, approximately 200 people, during the Portland Gale of November 1898.
- Maritime archaeologists have located 50 shipwrecks so far and six of them are listed on the National Register of Historic Places, this nations list of historically significant cultural resources.

## For More Information

NOAA's Stellwagen Bank National Marine Sanctuary off Massachusetts is the resting place for hundreds of shipwrecks. http://stellwagen.noaa.gov/maritime/welcome.html

NOAA's Maritime Heritage Program is an initiative of the Office of National Marine Sanctuaries. http://sanctuaries.noaa.gov/maritime/welcome.html

The National Park Service's Submerged Resources Unit conducts maritime archaeology projects throughout the National Park System: http://www.nps.gov/submerged/

# Stellwagen Shipwreck Word Search

The Stellwagen Bank Sanctuary sits astride the historic shipping routes and fishing grounds for many ports around Massachusetts. These harbors have been centers of maritime activity in New England for over 400 years. Many shipwrecks have been lost during that time as a result of storm, collision, and other calamities.

S H I P W R E C K S R B Y M I

Y F K D G F M M O T E P D T C

S Z S A N K I T S E N N N Y K

A O K U I X T Q E A O W A Q M

N I H T V T I X B M O C L H F

C K S K I G R B I S H A T N H

T N I T D Q A D C H C H R Q U

U U V Q E T M X N I S I O D J

A L H X G L M X L P J S P Q L

R R J E C V L R U E A T I A E

Y U G D J C F W K Z T O O B G

R Y Y G O L O E A H C R A M V

T W J V T Y V Q R G N I X Z J

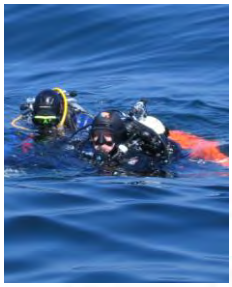
Z J R E A S I T X K E C H M G

K D A G M W Y A N P L N K I T

ARCHAEOLOGY
DIVING
HISTORIC
STELLWAGEN
MARITIME
PORTLAND
SANCTUARY
SCHOONER
SHIPWRECK
STEAMSHIP

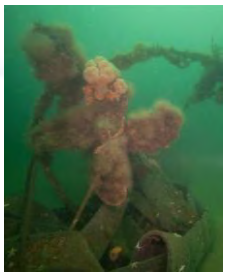
# Guide the Divers through the Underwater Maze to Find the Shipwreck

Difficulty: Easy



START

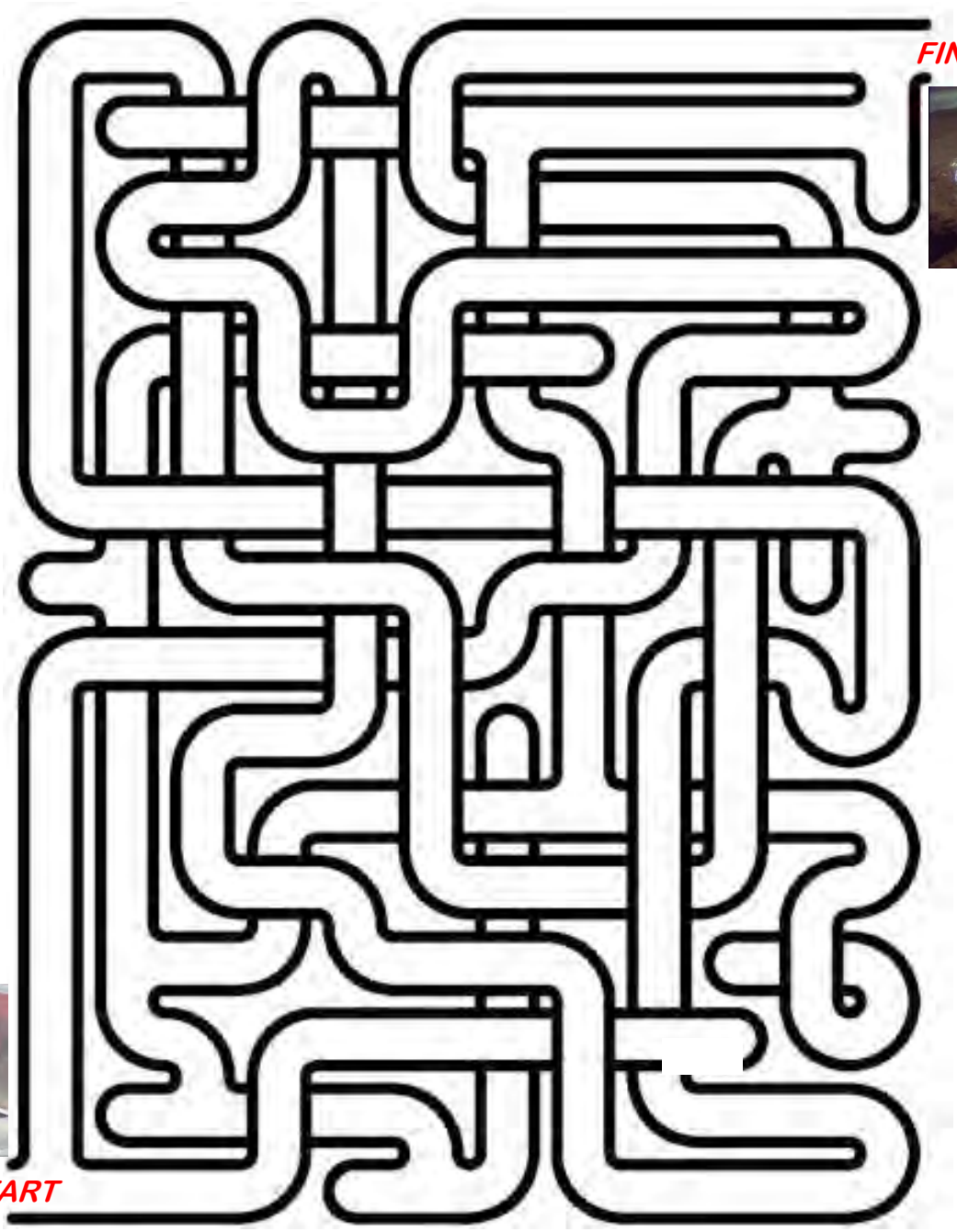
FINISH

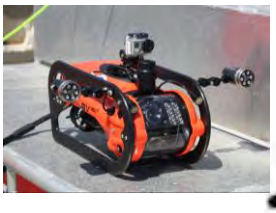



Sanctuary archaeologists are also SCUBA divers so they can venture down and investigate lost vessels first hand. Using underwater measuring tapes, pencils, waterproof paper, and cameras they document the shipwrecks to learn more about our past. There are many dive sites for the public to enjoy such as the fishing vessels *Josephine Marie* and *North Star* as well as the unidentified trawler.

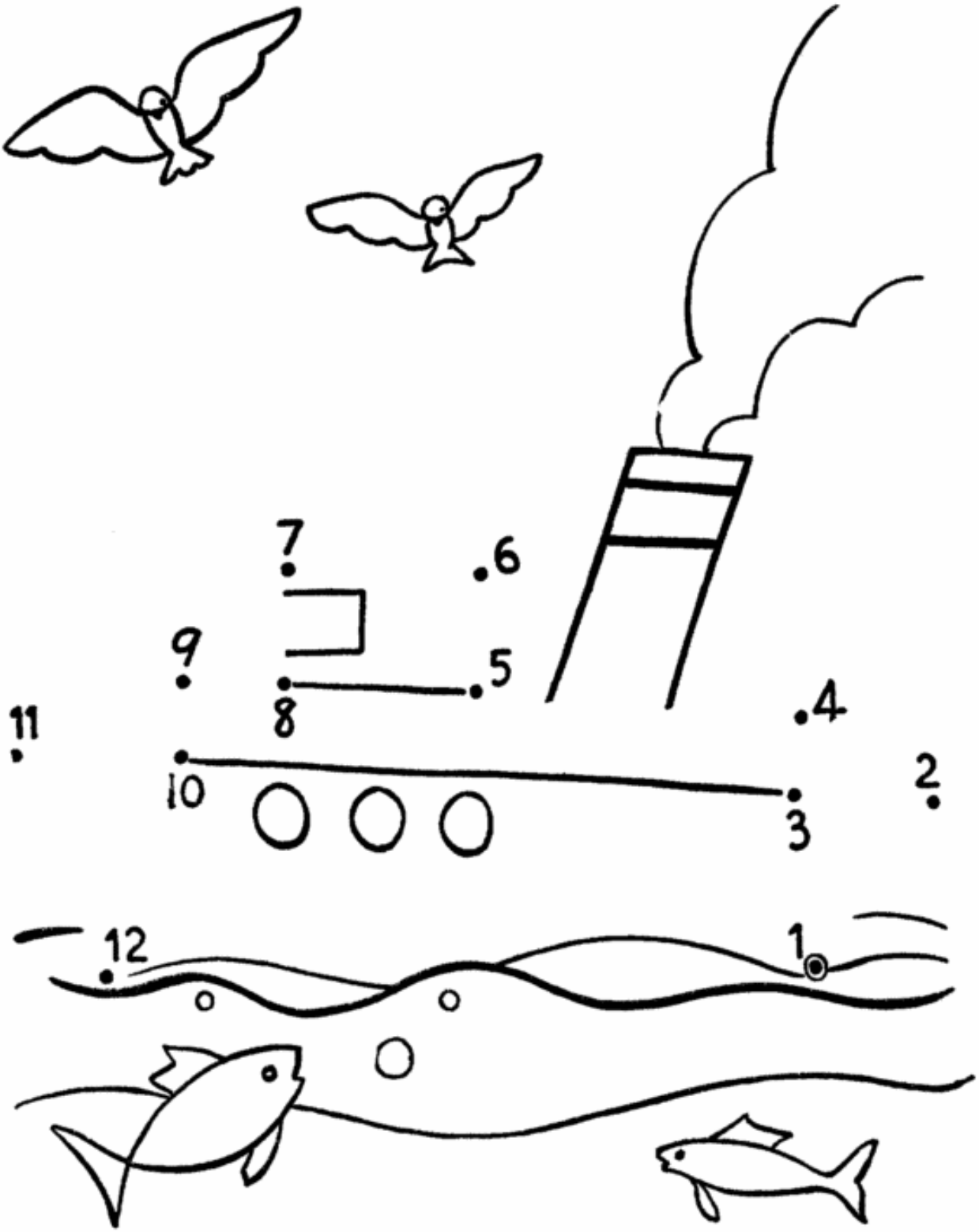
# Guide the Remotely Operated Vehicle (ROV) through the Underwater Maze to Find the Shipwreck

Difficulty: Hard



ROVs are tethered robots that "fly" through the water allowing archaeologists to examine shipwrecks that are too deep and hazardous for SCUBA diving. Equipped with lights and cameras, ROVs are connected to a research vessel floating above them. ROV's can spend a nearly unlimited amount of time on a site investigating why a ship sank or how its crew lived onboard.




Connect the dots from **1** through **12**


Name: _____

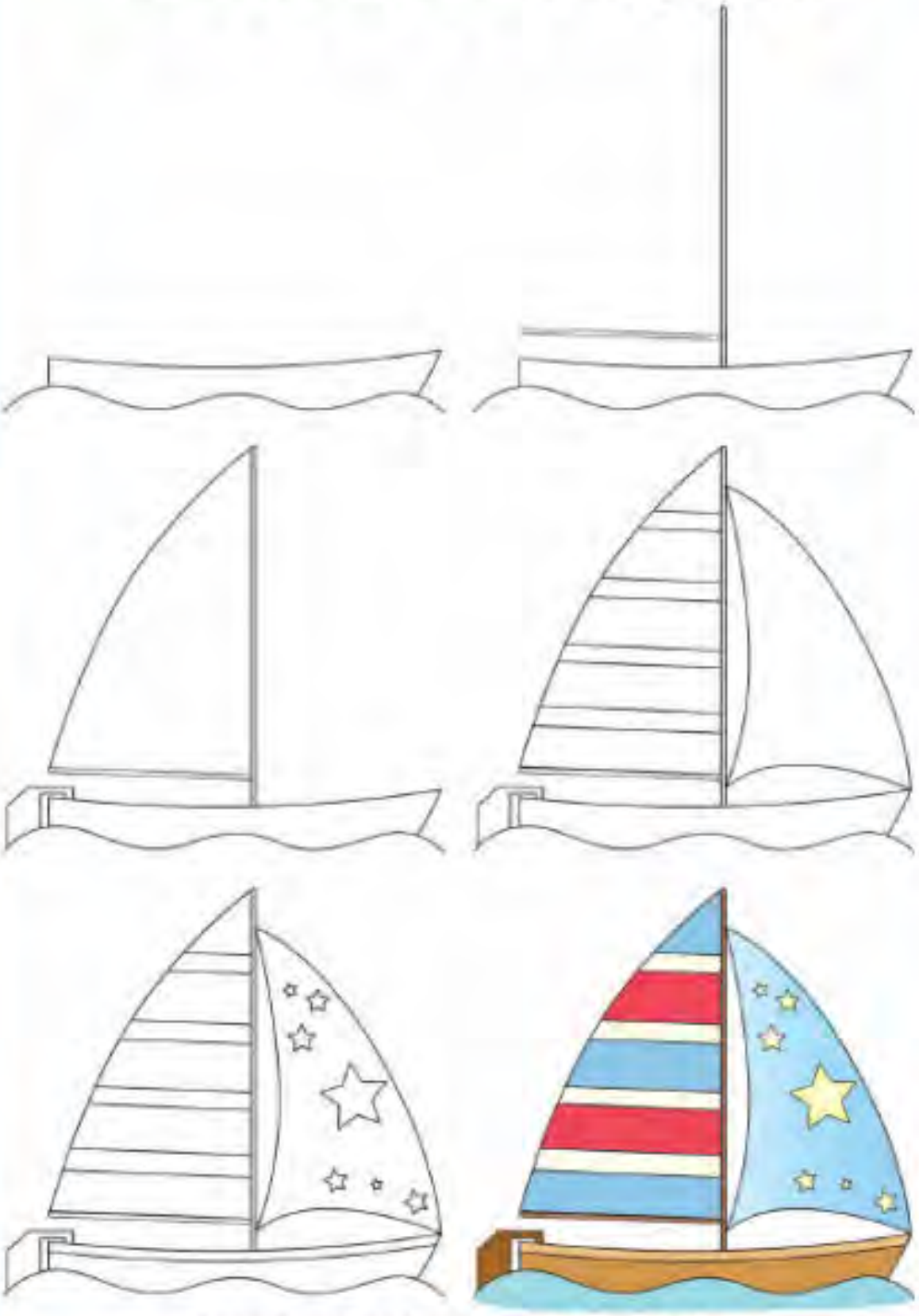
Alphabet Worksheet

# ABC Order - Dot to Dot

Draw a line to connect the dots in ABC order and complete the picture below. When done connecting the dots, color the picture.


All Esme Worksheets © Copyright Esmeworksheets.com

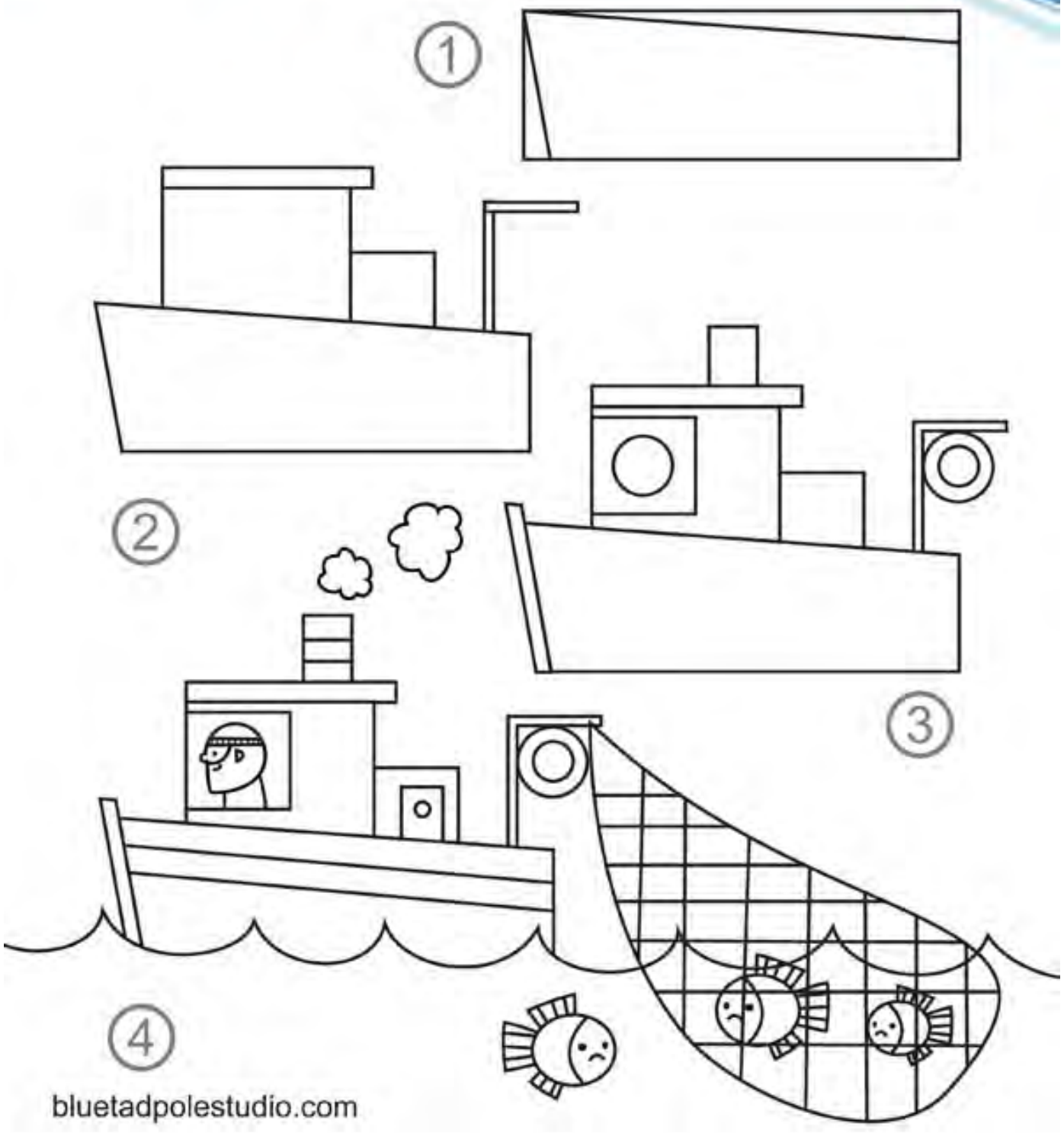
# Learn to Draw a Sailing Boat

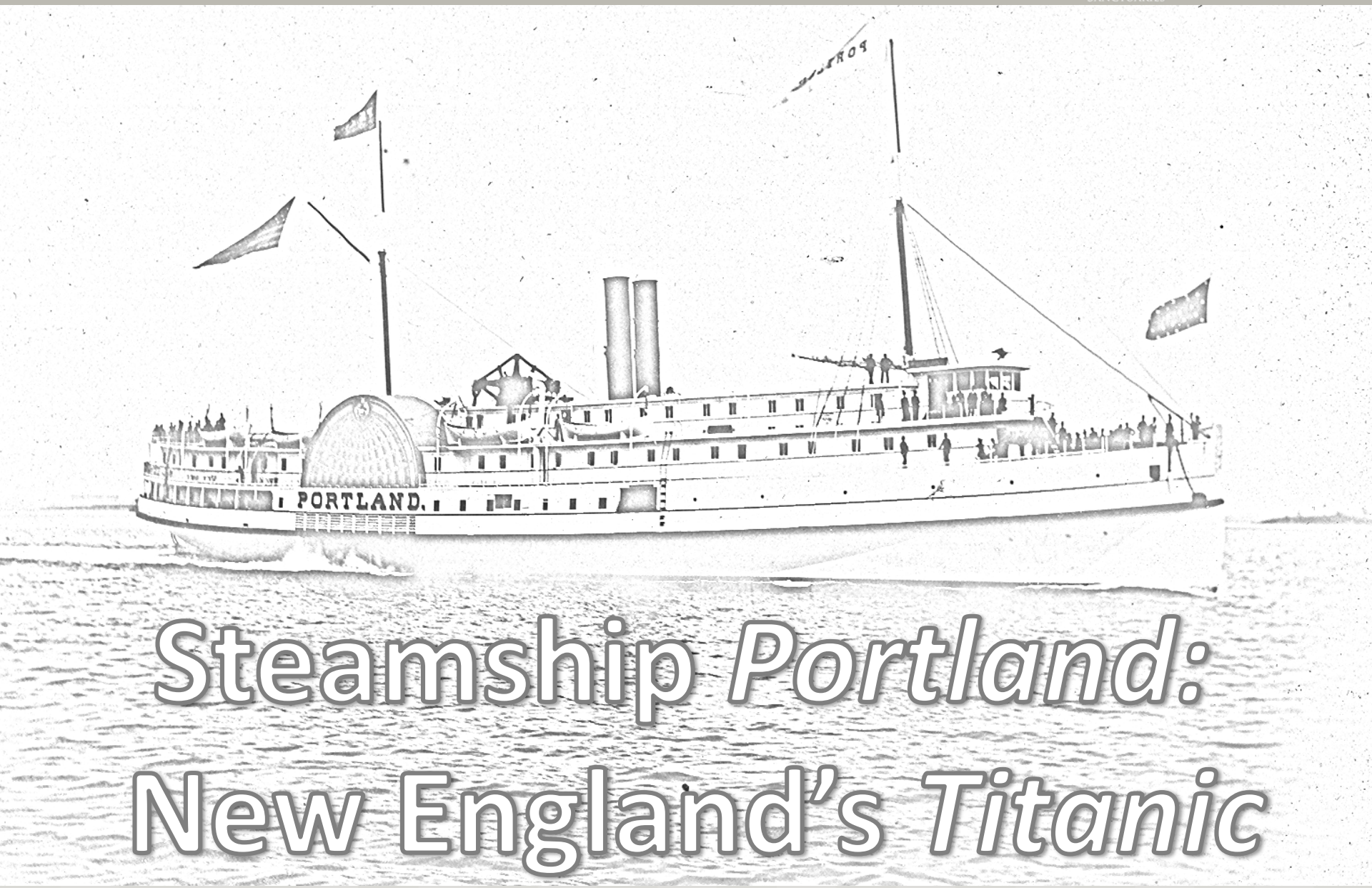


HOW TO DRAW:

# Fishing Boat

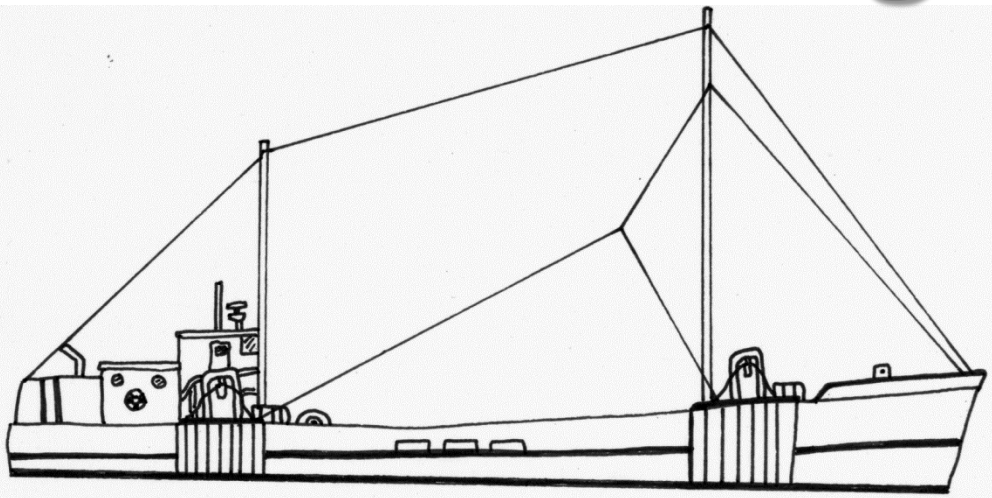
Blue Tadpole Studio



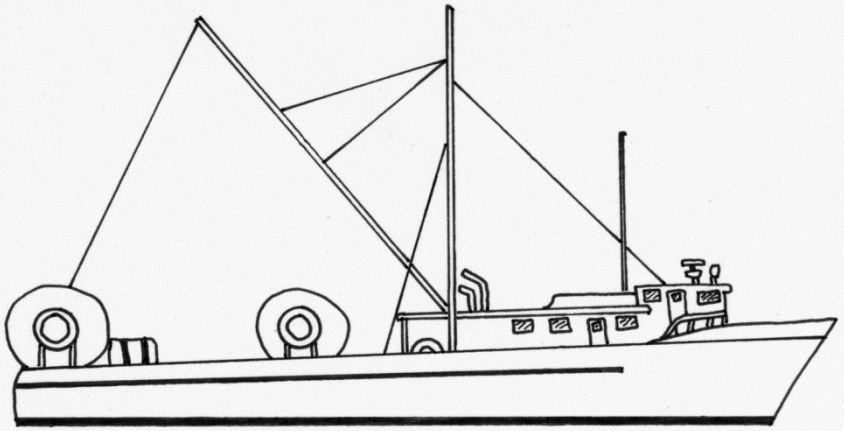



# Steamship *Portland*: New England's *Titanic*

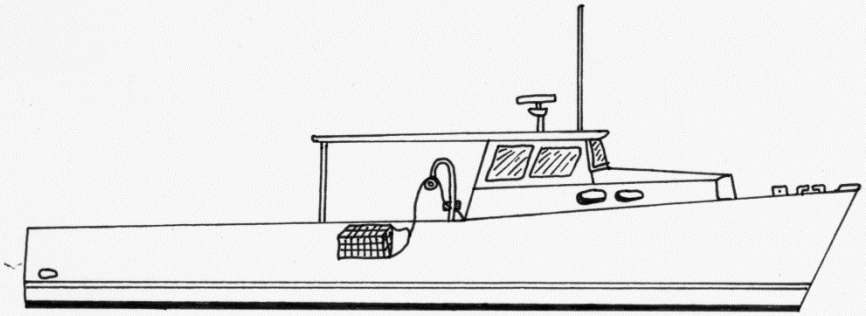
# Fishing Vessels



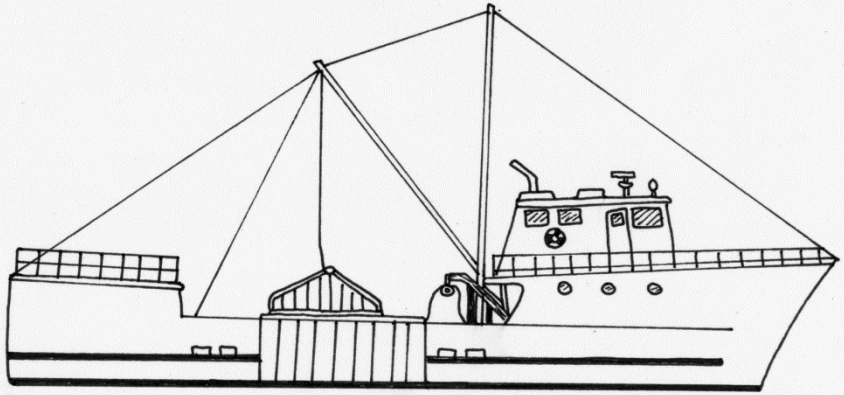
Eastern Rig Dragger



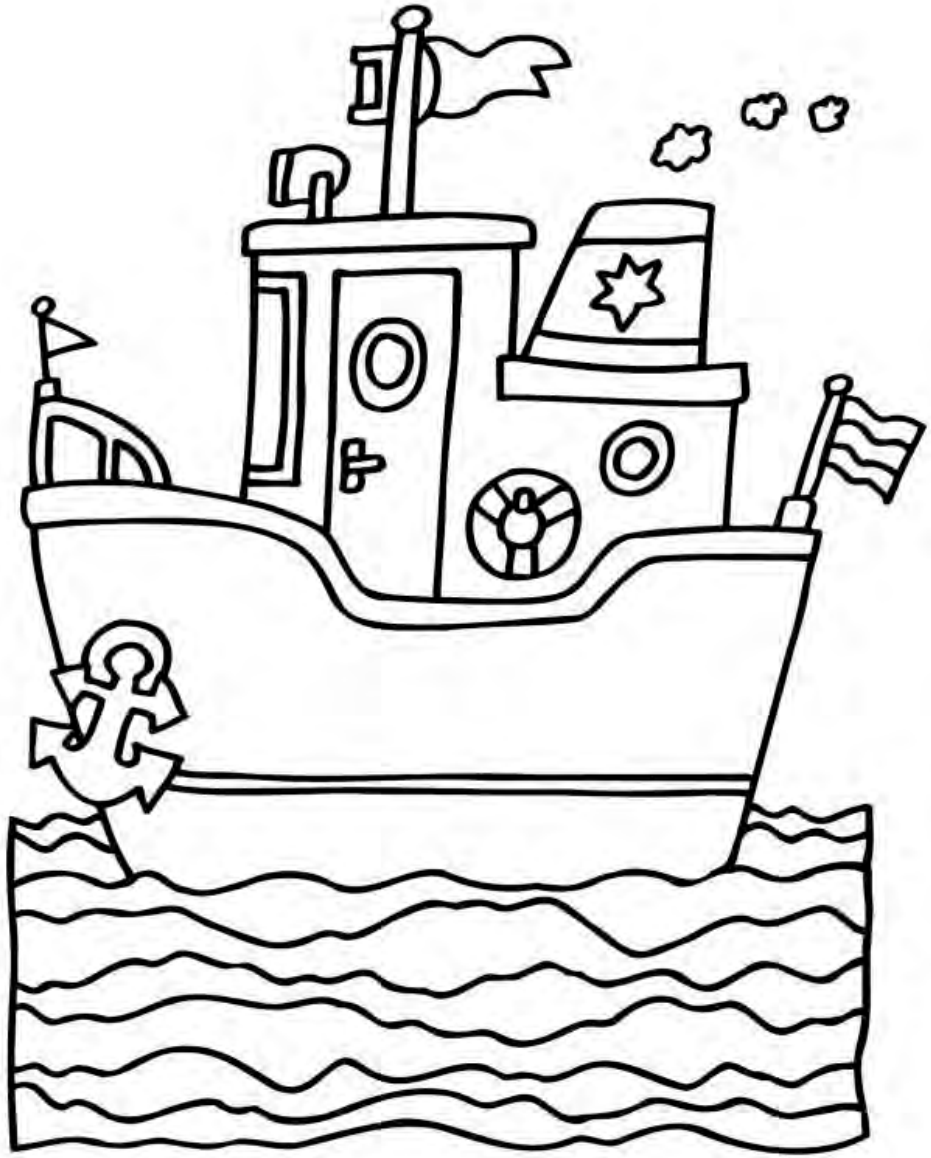
Western Rig Dragger



Lobster Boat

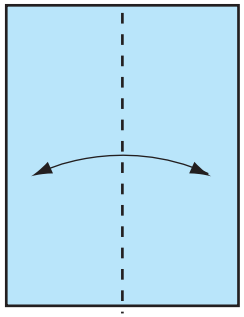


Scallop Dragger



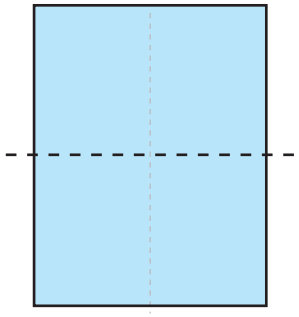
# Origami Boat Instructions

origami-fun
www.origami fun.com

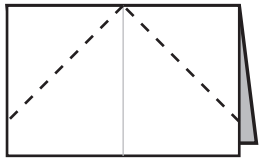


1. Start with a rectangular piece of paper, coloured side up.

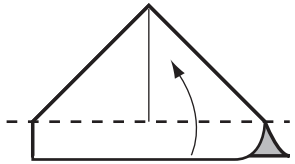
Fold in half, then open.



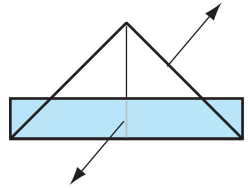
2. Fold in half downwards.



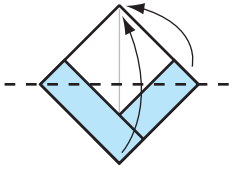
3. Bring corners in to centre line.



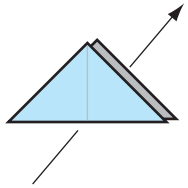
4. Fold uppermost layer upwards & do the same to the back. Crease well.



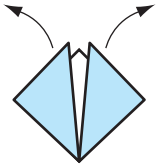
5. Pull the sides out and flatten.



6. Fold front layer up to top, then do the same at the back.



7. Pull the sides apart and flatten.

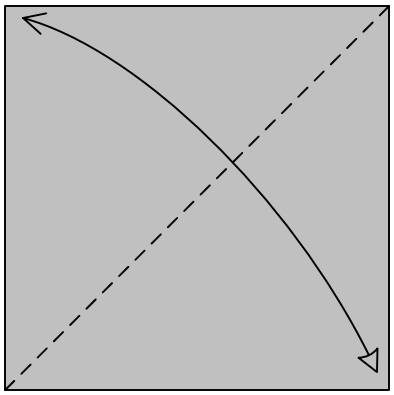


8. Gently pull the top parts of the model outwards, making a boat shape.

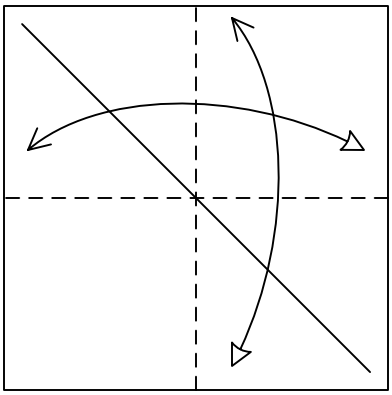
9. Flatten well to crease all folds. Then open out slightly, forming a boat shape. Finished Boat.

# Sailboat

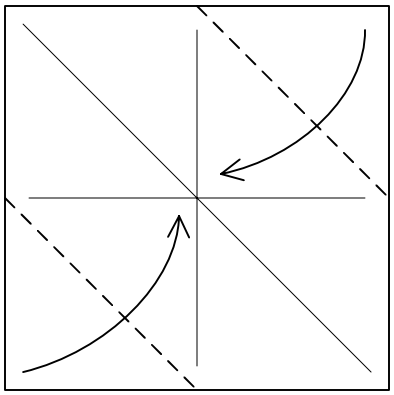
traditional



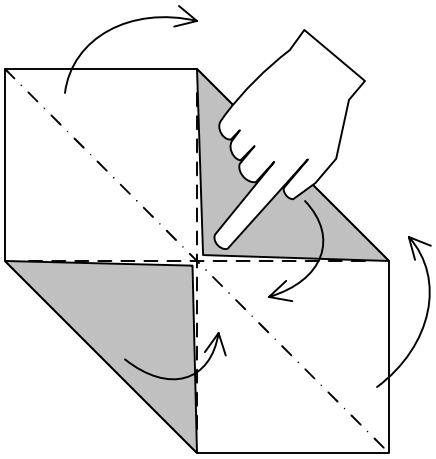
1. Begin with a square, color side up. Precrease along the diagonal. Turn over.



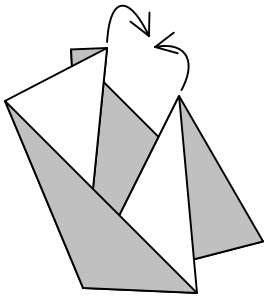
2. Precrease in half both ways.



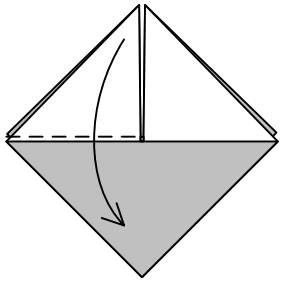
3. Valley fold two corners to the center.



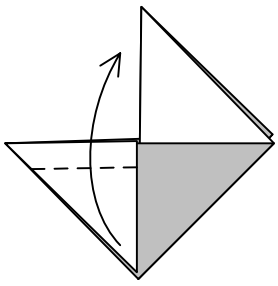
4. Pop the center allowing the opposite corners and the folded edges to come together.



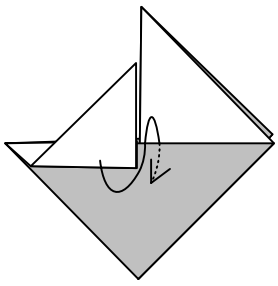
In progress.



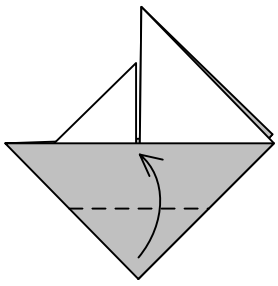
5. Valley fold down the flap along the edge.



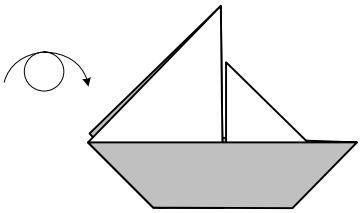
6. Valley fold up the flap.



7. Open the pocket and tuck inside.



8. Valley fold the tip to the center. Turn over.



Sailboat complete

Diagrams © 2009
Marcio Noguchi

Photo: NOAA/SBNMS and Applied Signal Technology

The schooners *Frank A. Palmer* and *Louise B. Crary* collided and sank in 1902 and remain connected at their bows on the seafloor.

Photo: NOAA/SBNMS and NURTEC

Artifacts, such as the sink and toilet in the *Frank A. Palmer*'s head, provide a glimpse into life onboard a 19th century schooner.

Photo: LARC

Fishermen began using eastern rig draggers in the sanctuary's waters around 1920. These vessels are one of the most common shipwreck varieties found in the sanctuary.

# Maritime Heritage Preservation

Located at the mouth of Massachusetts Bay, Stellwagen Bank National Marine Sanctuary sits astride historic shipping routes and fishing grounds for many of Massachusetts' oldest ports. During the past 400 years, a variety of maritime activities have taken place in and around the sanctuary, including whaling, immigration, transatlantic commerce, naval warfare and rum running. Historical research has identified hundreds of vessels lost in the vicinity of the sanctuary due to storms, collisions, and other maritime calamities. To date, sanctuary archaeologists have located 40 shipwrecks, ranging from wooden sailing vessels to modern trawlers.

The sanctuary is required by the National Marine Sanctuaries Act and the National Historic Preservation Act to locate, assess, protect and interpret its archaeological resources. In the Stellwagen Bank sanctuary, shipwrecks constitute the primary heritage resource. These lost vessels are time capsules on the sea floor, each capturing various aspects of our maritime history. Archaeological investigation of these gateways to the past provides insights into the evolution of shipbuilding, the changing role of waterborne commerce, and the cultural mores of the day.

Through public participation in scientifically grounded management, the sanctuary attempts to meet its stewardship responsibilities for present and future generations. Similarly, the sanctuary endeavors to increase public understanding and appreciation of New England's important maritime heritage and to encourage all Americans to become stewards of our shared maritime legacy.

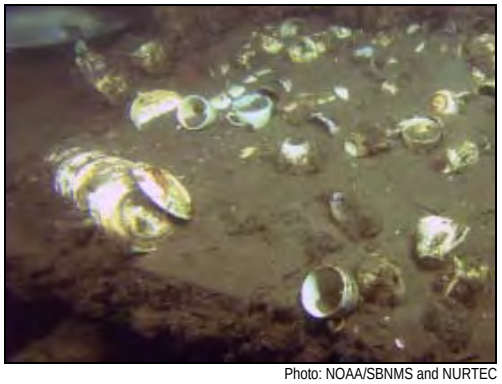


Photo: NOAA/SBNMS and NURTEC

Fragile plates and teacups survived the steamship *Portland*'s fall to the seafloor in 1898 (above). A side scan sonar image of the shipwreck (below) depicts the vessel's remarkably intact hull.

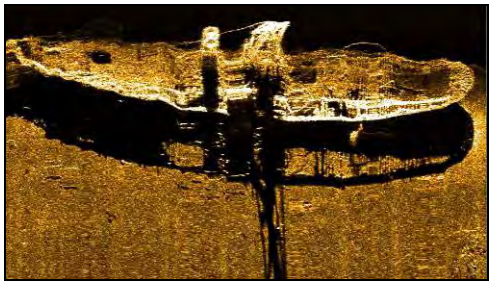


Photo: L-3 Klein Associates, Inc.

## Exploring New England's Fishing Heritage

Massachusetts Bay has been a focus of fishing activities for thousands of years. The area was first fished by Native Americans who hunted and collected a variety of foods along the bay's edge. During the colonial period, fish played a large role as one of the region's main export commodities. As technology progressed, fishing vessels and fishing methods evolved to meet the demands of the market. The small, open craft of the earliest European colonists were replaced by larger barks as New England's fishermen exported their catch to the Caribbean. Likewise, the swift schooners of the 19th century were supplanted by engine-driven trawlers in the 20th century. Intense fishing activities unfortunately led to losses at sea. The resulting collection of fishing vessel shipwrecks in the sanctuary serve as windows to the past, providing tangible connections to New England's maritime heritage.

# Shipwreck Gallery

## Steamship *Portland*

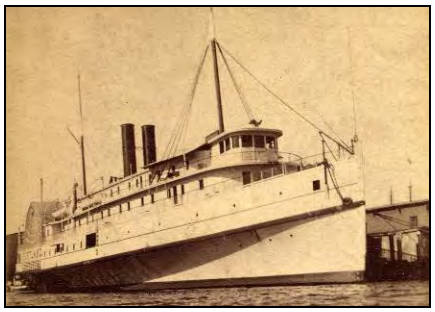


Photo: LARC

The Maine-built, wooden-hulled paddle wheel steamship *Portland* sank with all hands, nearly 200 people, in November 1898. Known as "New England's *Titanic*," it was the first sanctuary shipwreck listed on the National Register of Historic Places. The vessel's remains are the best-preserved "night boat" located to date.

## Granite Wreck

Photo: NOAA/SBNMS and NURTEC

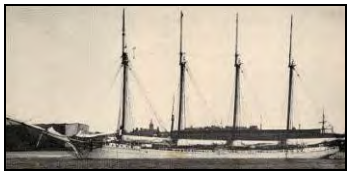
The granite wreck is an unidentified sailing vessel with an unusual cargo of granite sewer basin covers used in the construction of street corner and gutter systems in cities. During the 19th and 20th centuries, vast quantities of granite blocks were cut from New England's rocky islands and headlands and shipped by water to American cities.

## Eastern Rig Dragger *Edna G.*

Photo: Maine Maritime Museum

The eastern rig dragger *Edna G.* sank in 1988 off Gloucester. Its 32-year working life encompassed vast changes in the New England fishery and is emblematic of a rapidly disappearing watercraft variety.

## Schooners *Frank A. Palmer* and *Louise B. Crary*



Photos: Maine Maritime Museum

The coal schooners *Frank A. Palmer* and *Louise B. Crary* collided in 1902, yet are amazingly well preserved. They provide researchers a unique opportunity to explore two similar vessels at one location.

## Mystery Collier

Photo: NOAA/SBNMS and NURTEC

The mystery collier is a small coal-carrying wooden-hulled sailing vessel. Vessels of this size were more common than great coal schooners and carried coal to heat people's homes, power textile factories, and fuel railroads during the 19th and 20th centuries.

## Steamship *Pentagoet*

Photo: Courtesy of the Deer Isle – Stonington Historical Society

The wreck of a wooden vessel, believed to be the steamship *Pentagoet*, lies on top of Stellwagen Bank in over 100 feet of water. The *Pentagoet* was lost off Cape Cod during the Portland Gale in 1898 with its 18-man crew.

## Schooner Paul Palmer

Photo: LARC

The partially buried remains of the coal schooner *Paul Palmer* lie on a stretch of flat, sandy seafloor atop Stellwagen Bank. A large, steam-powered windlass, used to raise its anchors, marks the vessel's bow. Built in Waldoboro, Maine in 1902, the unlucky schooner, which set sail on its final voyage on Friday the 13th, was nearly twice destroyed by fire before it burned and sank off Cape Cod in 1913.

## Eastern Rig Dragger *Joffre*

Photo: Maine Maritime Museum

Built as a fishing schooner in the famous shipyards of Essex, Mass., the *Joffre* landed record halibut catches during the 1920s. Converted to an eastern rig dragger in 1938, *Joffre* had a significant second career catching Acadian redfish before fire claimed the vessel in 1947 off Gloucester. Today, *Joffre*'s massive diesel engine marks its resting place.

## Stern Trawler *Acme II*

Photo: Phil Cusumano

The steel-hulled trawler *Acme II* sank in 1988 while fishing 20 miles off Gloucester. The 65 foot long vessel is located in over 400 feet of water. It sits upright and is completely intact.

Photo: Matthew Lawrence/SBNMS

Large spiny sunstars cling to boulders found at the Sponge Forest dive site on Stellwagen Bank.

Photo: Heather Knowles/Northern Atlantic Dive Expeditions, Inc.

A diver explores the pilothouse of the unidentified trawler shipwreck sunk in 105 feet of water on top of Stellwagen Bank.

Photo: Matthew Lawrence/SBNMS

Divers interested in photography and videography will find a variety of different subjects, from shipwrecks to fish and colorful invertebrates.

# Diving

While many of New England's most popular dive spots are relatively close to shore, some excellent diving can be found further afield. Stellwagen Bank National Marine Sanctuary's position between Cape Ann and Cape Cod offers divers a chance to explore different environments at the mouth of Massachusetts Bay, where strong currents and exposed waters create challenging dive conditions.

Fifteen percent of the sanctuary, or 126 square miles, is shallower than 130 feet at low tide. Much of this area lies atop Stellwagen Bank, where depths range from 65 feet in the south to 110 feet in the north.

Dive sites in the sanctuary include numerous shipwrecks and natural habitat areas on Stellwagen Bank, Sanctuary Hill, and Jeffreys Ledge. The sanctuary is home to a variety of marine life. What you will see depends upon the environment you visit. In the sand and gravel areas on top of Stellwagen Bank you may encounter sand lance schools, while the piled boulders on Jeffreys Ledge hide Acadian redfish and Atlantic wolffish. At nearly every location you will encounter large sponges and anemones encrusting rocks or shipwreck structure.

The types of fish inhabiting most parts of the sanctuary include: sculpins, flounders, monkfish, cunner, skates and cod. Schools of dogfish or pollock make dives exciting.

Diving offshore is unlike diving at a similar depth inshore. In addition to deep water, you may experience strong currents. Plan your dive around slack tide for the best conditions. Slack tide on Stellwagen Bank can best be judged by subtracting 30 minutes from slack tide at the Boston Light or Race Point tide stations. Another hazard divers may encounter is fishing gear. Gill nets pose the greatest threat because they are hard to see and designed to ensnare. Additionally, monofilament line, lobster pot lines, and derelict trawl nets can also entangle divers.

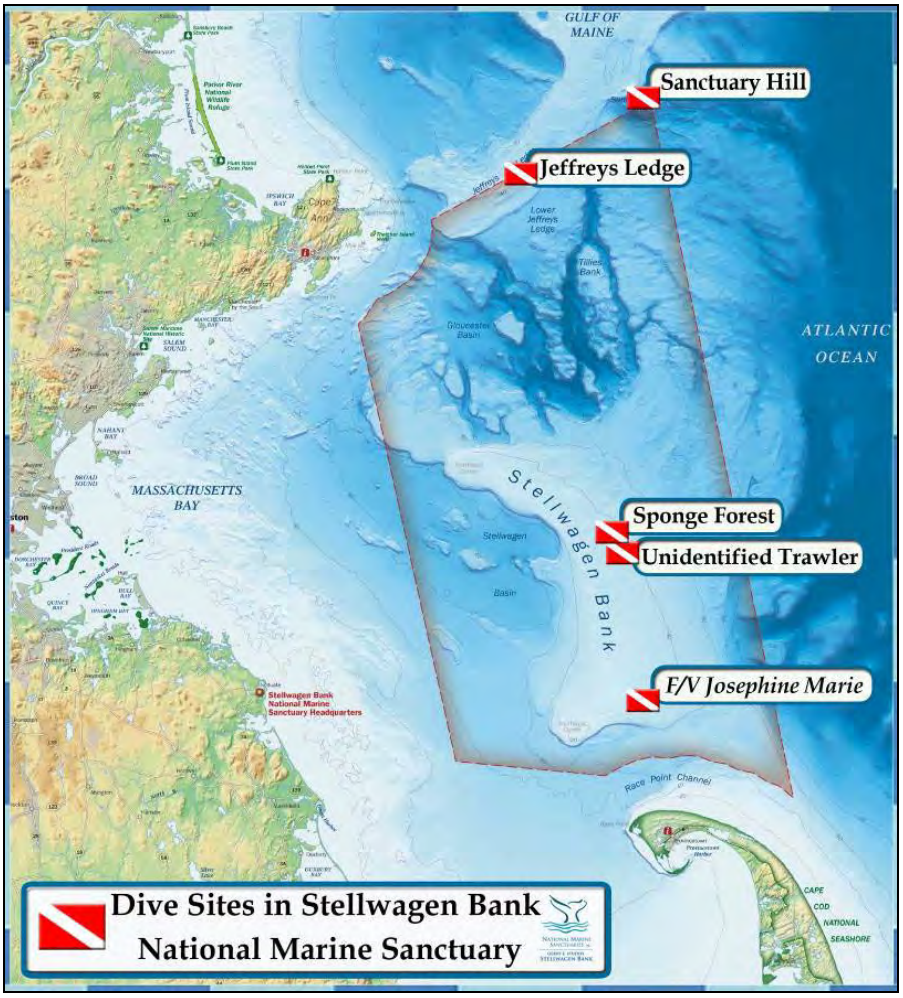
Dive vessels should fly a red and white diver down flag and the blue and white international dive flag since the sanctuary is frequently transited by both American and foreign-flagged ships. Also be aware that a portion of the sanctuary is located in the shipping lanes for vessels coming into or out of the port of Boston.

Visit the sanctuary's website for a list of dive charters that may run trips to Stellwagen Bank National Marine Sanctuary.

## Sanctuary Regulations Pertaining to Divers

Divers visiting the sanctuary must follow regulations that protect historical resources and marine mammals. Divers are prohibited from possessing, moving, removing or injuring, or attempting to move, remove or injure, a sanctuary historical resource. Divers are not permitted to grapple a historic shipwreck or tie a down-line onto a historic shipwreck. Diving to purposely interact with whales is considered harassment under the Marine Mammal Protection Act. Similarly, any boating activity that harms a whale or causes a whale to change its behavior is also a violation of the Marine Mammal Protection Act and the Endangered Species Act.

# Dive Site Guide




## Stellwagen Bank

Stellwagen Bank is a glacially deposited sand and gravel feature created by the retreating Laurentide Ice Sheet that covered much of New England during the last period of glaciation. Approximately 12,000 years ago, Stellwagen Bank rose above sea level, allowing animals and possibly humans to walk its surface. Archaeological research may one day find Native American artifacts or terrestrial animal or plant remains.

Stellwagen Bank is shallowest at its southern end, rising to within 65 feet of the surface. In this area, the sandy bottom is pockmarked with lobster holes. Moving north along the bank's top, the seafloor slopes to a relatively constant depth of 110 feet. While the bank's sandy areas offer the opportunity to view schooling fish, areas with hard-bottom habitat, such as the Sponge Forest, provide a greater diversity of marine life.

## Jeffreys Ledge

Jeffreys Ledge is a large glacial remnant, stretching 33 miles from offshore of Rockport, MA to Cape Elizabeth, ME. On the northern edge of the sanctuary, rocky ridges on the southern edge of Jeffreys Ledge rise to within 110 feet of the surface. The shallowest portion of the ledge is comprised of piled cobble and boulders.

## Sanctuary Hill

In the sanctuary's northeast corner, Sanctuary Hill rises from 325 feet to 115 feet and is topped with solid granite and piled boulders. Like Jeffreys Ledge, the hill's hard substrate is home to a variety of invertebrates and fishes that live on and in the piled boulders. Since Sanctuary Hill is 18 nautical miles offshore, the bedrock outcropping experiences very strong currents.

## F/V *Josephine Marie*

Photo: John Harper

Location: 42-10.925 N x 70-13.466 W

The *Josephine Marie* lies on the southern end of Stellwagen Bank in 105 feet of water. The 80-foot long, steel-hulled stern trawler sank in 1992 while returning from a fishing trip. The distinctive black hull of the *Josephine Marie* lies upside down with its bow facing roughly southeast. The vessel's propeller makes for a great photo opportunity.

## Unidentified Trawler

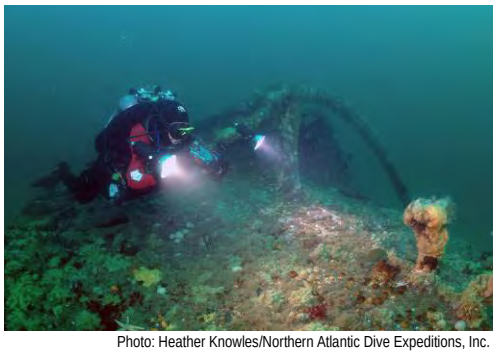


Photo: Heather Knowles/Northern Atlantic Dive Expeditions, Inc.

Location: 42-18.73056 N x 70-17.8425 W

An unidentified trawler shipwreck rests on Stellwagen Bank in 105 feet of water. The vessel has broken into four pieces: wheelhouse, hull, stern and net reel. These three-dimensional structures sitting on a flat sand bottom attract schools of cod and pollock that hide within their parts. If you know the vessel's identity, please contact the sanctuary. The shipwreck is in the outbound Boston shipping lane. Dive boats must abide by shipping lane regulations.

## Sponge Forest

Photo: Ben Cowie-Haskell/SBNMS

Location: 42-19.471 N x 70-17.598

The Sponge Forest is an area on top of Stellwagen Bank with cobble and boulders that provide hard substrate for the finger sponges after which it was named. Codfish hide behind and among the larger boulders that are also home to large northern red anemones and other invertebrates.